The CAVE and Beyond: VR Art in Museums and Galleries

Organizer
Josephine Anstey
University at Buffalo
248A Center for the Arts
Buffalo, New York 14260 USA
+1.716.645.6902
jranstey@buffalo.edu

Panelists
Donna Cox
National Center for Supercomputing Applications
University of Illinois

Horst Hörtner
Ars Electronica Futurelab

Daniel J. Sandin
University of Illinois at Chicago

Paul Sermon
University of Salford

Jeffrey Shaw
Zentrum für Kunst und Medientechnologie

Immersive, interactive VR systems (CAVEs, domes, etc.) deliver unique artistic, entertainment and educational experiences. Worldwide, there are a growing number of such systems open to the public on a daily basis. This panel examines the historical strengths and weaknesses of using VR in public spaces and the challenges of creating VR experiences for different kinds of audiences. We discuss how the use of VR has expanded; whether the "wow" factor continues to play a stronger role in attracting an audience than the work itself; what has really worked; and what the problems are. We contemplate the directions (aesthetics, content, and technical advancements) for VR as a public display medium.

The motivation for convening this panel is threefold: to discuss VR production and VR installation for public display; to examine the cross-over of the latest technical research into art practice; and to create a forum where the panelists and members of the audience can pool information, learn from each other, and delineate controversial areas.

Josephine Anstey
In a typical VR experience, you share the CAVE with a group, flying together across galaxies, watching molecules mate, effecting turbulent gas flows, meeting virtual guides. But what if the guide wants to whisper you a secret? What if you don't want your interactions watched by all the others? I develop virtual fiction experiences. Unlike a novel or film where the audience identifies with the main protagonist, in this fictional form, the user is the main protagonist. For the experience to have the most impact, the user must feel comfortable and confident enough to engage with the piece physically and emotionally. This often means being alone with the piece. The high cost of immersive projection technology (IPT) systems makes them rare in the kind of spaces (museums, galleries, conferences, and festivals) where my VR Fiction shows; their popularity and the economics of throughput make an experience for one user alone unfeasible. Yet I believe that such an intimate setting is crucial for this type of application. The next step is a prototype IPT system that is cheap enough to be widely used for one-on-one experiences in art exhibitions and robust enough for daily wear and tear.

Josephine Anstey is a virtual reality and video artist. Her latest work is an immersive VR fiction, "The Thing Growing." She has collaborated on "Shared Miletus," a networked VR piece, and the "Multi Mega Book in the CAVE," winner of a Multimedia Grand Prix 97 Award from the Multi-Media Content Association of Japan. These VR pieces have shown widely in the US, Europe, and Japan. Since 1983 she has collaborated on a series of videos with video artist Julie Zando, which have shown internationally and won awards including the Best Narrative Video Award (Atlanta Film and Video Festival, 1990) and Best Experimental Video Award (Atlanta Film and Video Festival, 1989). Many of the videos are in the permanent collection of the Museum of Modern Art in New York. She is currently a visiting assistant professor at the University at Buffalo.

Donna Cox
In our work with the American Museum of Natural History Hayden Planetarium, my collaborators and I use CAVE technology not only as a display device, but also as a remote production tool. We regularly do Champaign-New York sessions to develop new exhibits using Virtual Director, a choreography tool developed by three artists: Donna Cox, Robert Patterson, and Marcus Thiebaux. The digital dome at the Hayden is like a seven-wall CAVE with edge blending. Projectors throw 70 feet, creating a hemisphere where 440 museum attendees can go on a tour from earth, to the Milky Way, to the Virgo Cluster, and beyond into the large-scale structure of the universe. Our team contributed over four minutes of visualization to the Passport to the Universe digital dome exhibit, and we are currently working on the Big Bang. The digital tours are created from observational and computational data that is artistically choreographed, colored, and rendered. Artists, technologists, and scientists work together to develop content for these large displays. Over two million people have seen Passport to the Universe. The new Big Bang exhibit is scheduled to open 4 July 2001.

Donna Cox is professor in the College of Fine and Applied Arts, University of Illinois, and a research artist/scientist at the National Center for Supercomputing Applications. She is a recognized pioneer in scientific visualization. She was appointed to the editorial board for Leonardo Journal and elected as a voting council member of the Internet2 Strategic Applications Council. She was associate producer for scientific visualization and art director for the Pixar/NCSA segment of "Cosmic Voyage" the IMAX film nominated for an Academy Award in 1997.

Horst Hörtner
The City of Linz opened the Ars Electronica Center (AEC) in September 1996 as a Museum of the Future. The museum includes the first CAVE that was open to the public in an institution that is equally dedicated to art and technology. The CAVE environment was specifically designed with the knowledge that it would be heavily used on a daily basis for presentations of all kinds (art, research, industry, architecture, medicine, etc.). To support a CAVE and many changing applications, it is not enough to have specially trained technicians. To create new applications for the Ars Electronica Center's CAVE, the center's development laboratory, Futurelab, is crucial. Its main goals are: to give the computer art community a place to exhibit and work on production (art research); to increase the possibilities for local industry to work with high-end VR equipment on application-based research in VR without incurring immense investments.

Horst Hörtner is technical director at Ars Electronica Center, where he is responsible for designing and setting up installations, including the CAVE. In 1997, he became director of Ars Electronica FutureLab, where he directs design of virtual environments, concepts for interactive installations, and systems design for Web-based applications. In 1997, he also became a Member of Christian Doppler Laboratorium for software engineering at Johannes Kepler Universität, Linz and associate professor at the Universität, für künstlerische und industrielle Gestaltung, Linz. In 1998, he became a Member of the Multimedia Content And Broadband Expert Group (5th Framework Program, European Commission, DGXIII/E-4).

Daniel J. Sandin
A common comment when people first experience the CAVE or even the ImmersaDesk is to say that these devices would have tremendous application in entertainment and museum settings. The chief success of projection-based VR has, however, been in the research community. Deploying CAVEs or CAVE-like systems and even single screen projection-based VR in museum settings has been much less frequent than expected. I think the problem with placing these devices in museums and galleries can be summarized as: they cost too much money, they take up too much space, they have too little throughput, and they have expensive glasses and tethered tracking systems. There are developing technologies that can change this situation. The falling cost of computation, revolutions in projection technology, and the emergence of flat-panel displays provide opportunities to address these issues. I discuss how to apply these technological changes to the design of projection VR installations in a museum context: In particular, two new designs utilizing polarization-based LCD projectors, the Front Projected ElsieDesk and a tripod arrangement of three rear-projected screens.

Daniel J. Sandin is director of the Electronic Visualization Laboratory and professor in the School of Art and Design at the University of Illinois at Chicago. His early interest in real-time computer graphics/video image processing and interactive computing environments motivated his pioneering work in video synthesizers and continues to influence his research interests. He is recognized, along with EVL co-director Tom DeFanti, for conceiving the CAVE virtual reality theater in 1991. Sandin's computer/video art has been exhibited at conferences and museums worldwide. His work is included in the inaugural collection of video art at the Museum of Modern Art in New York. He has received many grants and fellowships from such distinguished organizations as the Rockefeller Foundation, the Guggenheim Foundation, and the National Endowment for the Arts.

Paul Sermon
My current research involves the combination of live-action telepresent videoconferencing composited into immersive virtual environments utilising CAVE-based augmented spaces for public exhibitions. The reduction of CAVE-based systems to consumer PC accessibility is making it possible to customize the conventional four-wall CAVE into new interactive museum/gallery exhibits; integrate CAVE-based environments within telepresent installations that necessitate new projection methods for thematic experiences; and explore new architectured projection forms including corridors, alcoves, and staircases. This current research is developing a telepresent CAVE installation of connected rooms that will interface seamlessly with its physical surrounding – an interactive narrative and virtual environment that incorporates the physical installation space directly.

Paul Sermon is guest professor at the Academy of Art and Design in Linz, Austria. He is also reader in creative technology at The University of Salford, Research Centre for Art & Design, Manchester, England. He was awarded the Prix Ars Electronica Golden Nica in the category of interactive art, for the hypermedia installation Think about the People Now, in Linz, Austria, September 1991. He worked as an artist in residence and produced the ISDN video conference installation Telematic Vision at the Zentrums für Kunst und Medientechnologie in Karlsruhe, Germany, from February to November 1993. He received the Sparkey Award from the Interactive Media Festival in Los Angeles for the telepresent video installation Telematic Dreaming in June 1994.

Jeffrey Shaw
Many artists are deeply attracted to the unique expressive and experiential possibilities of immersive CG environments such as the CAVE. At the same time, we have to grapple with the related problems of locating and using technologies of this kind for a mass public. I describe four installations that demonstrate innovative technical and artistic solutions enabling public experience and interactivity with such technologies. PLACE is a 360-degree projection environment in which the viewer controls rotation of a large projected image from a motorized platform in the center of a large cylindrical screen. EVE (Extended Virtual Environment) is similar to PLACE in its functionality but uses an inflatable dome and a spherical projection surface so that the projected image can be interactively moved in two axes to create an immersive visualization environment. Room with a View is also a full-dome projection environment, but it uses multiple projectors to completely saturate the dome surface and constitute a fully immersive scene. conFIGURING the CAVE is an application that uses the proprietary CAVE technology but with completely custom software. Attaching cabled interfaces to the viewer was felt to be inappropriate in a museum context, so we developed a unique interface concept: a life-size wooden puppet.

Since the late 1960s, Jeffrey Shaw has pioneered the use of interactivity and virtuality in his many art installations. His works have been exhibited worldwide at major museums and festivals. For many years, he lived in Amsterdam, where he co-founded the Evenstructure Research Group (1969-80). Currently, he is director of the Institute for Visual Media at the Zentrums für Kunst und Medientechnologie in Karlsruhe, Germany. He leads a unique research and production facility where artists and scientists are working together and developing profound artistic applications of the new media technologies. His artworks include: The Legible City, Alice's City, Alice's Rooms, Revolution, the Virtual Museum, Disappearances, EVE, the Golden Calf, PLACE – A User's Manual, conFIGURING the CAVE, The Distributed Legible City, and PLACE – Ruhr.